United States Department of the Interior
U.S. Fish and Wildlife Service
2321 West Royal Palm Road, Suite 103
Phoenix, Arizona 85021-4951
Telephone: (602) 242-0210 FAX: (602) 242-2513

In Reply Refer To:
AESO/SE
2-21-99-F-170 January 5, 2000

Mr. Richard J. Schubel
Chief, Regulatory Branch
Department of the Army
Los Angeles District, Corps of Engineers
P. O. Box 532711
Los Angeles, California 90053-2325

Dear Mr. Schubel:

This document transmits the U.S. Fish and Wildlife Service's biological opinion based on our review of the proposed Department of the Army Section 404 permit to realign and channelize unnamed washes on an 80 acre parcel for the Tohono O'odham Gaming Authority located in Pima County, Arizona, and the possible effects on the federally listed Pima pineapple cactus (PPC) (*Coryphantha scheeri* var. *robustispina*). This document was prepared in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.).

This biological opinion was prepared using information contained in the December 1998 biological assessment prepared by SWCA, Inc., data in our files, published and unpublished literature, and other sources of information. Your March 10, 1999, request for consultation was received by our office on March 12, 1999.

Consultation History

Formal consultation began on March 12, 1999, the day the request to initiate formal consultation was received by the Service. The Bureau of Indian Affairs is required to meet the Nation's responsibility under the Endangered Species Act. This consultation is being conducted with both the BIA and the Corps. The Corps, who is serving as the lead agency in this consultation, has determined that there will be no effect to any other listed or proposed species. Consultants from SWCA have represented the Tohono O'odham Gaming Authority throughout the consultation.

The 135-day statutory time frame requires that a biological opinion be transmitted to you no later than July 23, 1999. On July 22, the Arizona Ecological Services Field Office received a telephone call from Tom Fergusen, of SWCA, to state that the project needed to be slightly

modified. On July 26, Mr. Fergusen spoke with Debra Bills of this office and notified us that the off-site mitigation area for the Pima pineapple cactus was not available, as described in the original biological assessment. Subsequent telephone discussions and an August 4 meeting between the Corps, SWCA, and the Service concluded a modified project description was needed. Subsequent discussions between SWCA, the Tohono O'odham Nation Natural Resources Department (TONNRD), and the Arizona-Sonora Desert Museum (ASDM) resulted in a four year mitigation plan intended to contribute to the understanding of ecological requirements of the Pima pineapple cactus. A draft plan was sent to this office in late September, and the final plan was received on November 12, 1999. On November 17, 1999, the Service received a telephone call from Tina Lee, SWCA, requesting full consideration of the proposed mitigation plan for this consultation. A draft biological opinion was sent to the Corps and the BIA on November 18. A December 23 letter was received from the Corps on December 27, requesting some editorial changes which were incorporated into this final document.

BIOLOGICAL OPINION

It is the Service's opinion that the proposed action is not likely to jeopardize the continued existence of the Pima pineapple cactus. There is no critical habitat for this species, therefore, none will be affected.

DESCRIPTION OF THE PROPOSED ACTION

The proposed federal action is the issuance of a Corps permit to the Tohono O'odham Nation. The Tohono O'odham Gaming Authority (TOGA) proposes to construct a 180,000 square foot casino on the San Xavier District of the Tohono O'odham Nation, on a designated 80-acre Pima Mine Road Alternative Casino Site. The project is located in Section 26, T16S, R13E, in Pima County, Arizona. The project elevation is approximately 2,750 feet, in the Sonoran desert.

In addition to the casino, the 80-acre site will consist of a 3,489- space parking lot, and a two-lane access road beginning at the existing Pima Mine Road. Two lagoons will be built on the northeast corner of the site to accommodate treated effluent. This water may also be used for irrigation of native and non-native vegetation around parking areas and buildings, but the effects of the water quality are not addressed in this consultation.

Construction of the facility will result in impacts to jurisdictional waters of the U.S., for which the Army Corps of Engineers governs through Section 404 of the Clean Water Act. Numerous washes will be rerouted as a result of this project. Landscaping in and around washes will consist of native vegetation. Impacts to all known PPC in the project area were determined to be unavoidable. Approximately 14 acres on the northwest corner of the project site will be left undeveloped.

This project has incorporated into its project plan a document titled "Mitigation and Monitoring Plan for the TOGA Casino II Project at Pima Mine Road, Tohono O'odham Nation, Pima

County, Arizona" prepared by SWCA, Inc. on behalf of the Tohono O'odham Gaming Authority (SWCA 1999). Implementation of this plan includes a transplant and research program of the PPC to be undertaken by the Arizona Sonora Desert Museum, funded by TOGA and administered by the National Fish and Wildlife Foundation. Additional funds from TOGA will be transferred to TONNRD for research and on site monitoring. This four-year conservation plan includes the following objectives:

Short-term Objectives:

1. Baseline data collection, removal, and storage of approximately 29 plants from the proposed project site after harvesting of mature fruits and seeds in the fall of 1999.

2. Baseline data collection from, and transplant of four to six plants from the portion of the 80-acre property that will be impacted during construction, to the approximately 14-acre portion to remain undisturbed.

3. Using harvested seeds and plants for scientific studies designed and implemented by the Arizona-Sonora Desert Museum and/or others such as Tohono O'odham Natural Resources Department, to provide much needed information about the species.

4. Using these studies as opportunities to provide training, education, and involvement of Tohono O'odham students in experimental approaches used in this project to study the ecology of PPC.

Long-term Objectives:

1. Understanding the distribution of PPC and potentially suitable habitat for the species on the Nation and to compile spatial data on current and projected land use plans, land ownership, and other factors potentially impacting PPC on Tohono O'odham lands.

2. Identify suitable and possible relocation sites on the Tohono O'odham Nation to the fullest extent possible.

3. Design and conduct additional research that will contribute substantially to the understanding of the ecological requirements and population dynamics of PPC and provide preliminary data on biotic and abiotic factors that affect demographic parameters of PPC populations. This will be done to the degree that this can be accomplished given the funding provided by this plan; this plan does not prohibit or otherwise preclude ASDM or TONNRD from securing other sources of funding to conduct additional research on this species.

4. Repatriation of all cacti, living or dead, to the TONNRD.

5. Provide TONNRD with a yet-to-be determined quantity of PPC and seedlings (e.g. some percentage or amount of the number of deceased original plants, if any) generated by ASDM's propagation efforts.

STATUS OF THE SPECIES

Life History

The final rule listing Pima pineapple cactus as endangered was published September 23, 1993 (58 FR 49875). The rule became effective on October 25, 1993, and critical habitat was not designated at that time. Factors which contributed to the listing included habitat loss and degradation, habitat modification and fragmentation, distribution characteristics and plant rareness, illegal collection, threats, and difficulties in providing protection of areas large enough to maintain functioning populations. The biological information below is summarized from the proposed and final rules, and other sources.

Pima pineapple cactus is a low growing hemispherical cactus with adults varying in stem diameter from 5.0 cm (2.0") to 21.0 cm (8.3") and height from 4.5 cm (1.8") to 45.7 cm (18.0"). Individuals are considered adults when they reproduce sexually through flowers. Plants can be either single or multi-stemmed with yellow flowers blooming after summer rains. Clusters of Pima pineapple cactus stems are formed primarily from vegetative clones produced at the plant base (Benson 1982, Roller 1996). The diagnostic characteristic of this taxon is the presence of one stout, straw-colored, central spine which is hooked. Radial spines extend laterally around the central spine and average 10 to 15 spines on large cacti and six on small cacti (Benson 1982).

Pima pineapple cactus occurs south of Tucson, in Pima and Santa Cruz counties, Arizona and adjacent northern Sonora, Mexico. It is distributed throughout both the Altar and Santa Cruz Valleys and in low lying areas connecting the two valleys.

Groups of flowers begin to bloom for single day periods following five to seven days after the first monsoon rains. Research has indicated flowering is triggered by as little precipitation as 3 mm. Generally flowers begin opening mid-morning and close at dusk. Adult plants will bloom one to three days each year, and flowering is usually over by the end of August. Cross-pollination produces significantly more viable seeds than self-pollination. Fruits are mature within two weeks following successful pollination. Germination has been observed in the field during the summer monsoon rainy season (Roller 1996). Anecdotal observations indicate the species' flowers are visited by a variety of native bees and European honey bees which leave the insects with their forehead and hind legs covered in Pima pineapple cactus pollen.

Habitat fragmentation and isolation may be an important factor limiting future seed set of this cactus. Recent data show that the species cannot self pollinate and is reliant on invertebrate pollinators. One hypothesis could suggest that the spatial distribution pattern of individual Pima pineapple cacti within a given area may be related to pollinator visitations, thus resulting in more

successful cross-pollination and subsequent seed set over the population (Roller 1996).

Population Stability

Using recent survey (1992-1997) information regarding Pima pineapple cacti locations, an extrapolated total population size for the species might appear to be much greater than actual on the ground, standardized observations would reveal. This taxon is extremely rare when numbers of known individuals are evaluated across its range. Pima pineapple cactus is widely dispersed in very small clusters across land areas which are well suited for residential, commercial or mining development. Moreover, field observations suggest a great deal of land area within the range boundaries does not support Pima pineapple cactus due to historic human impact or some other environment constraint. Thus, populations are already considerably isolated from each other in specific portions of the range and population size and apparent recruitment vary significantly across the range. Population variability may relate, as observed on a more local scale; to habitat development, modification, and/or other environmental factors such as slope, vegetation, pollinators, dispersal mechanisms, etc.

Habitat which contains denser populations, better recruitment, and individuals exhibiting greater plant vigor, represents a transition zone between the two regions of vegetation described by Brown (1982) as semi-desert grassland and Sonoran desert-scrub. Vegetation within this transition zone has been characterized as being dominated by mid-sized mesquite trees, half shrubs (snakeweed, burroweed, and desert zinnia) with patches of native grass and scattered succulents. Because populations are healthier in this transition zone, conservation within these areas is very important (Roller and Halvorson 1997). However, this important habitat type is not uniformly distributed throughout the plant's range. Populations of Pima pineapple cacti are patchy, widely dispersed and highly variable in density. Higher population densities have only been documented at three sites. Compared to other surveys, two of these sites are very small in scale and range from 6.3 and 7.5 plants per ha (approximately 3 plants per acre). This fact may tend to skew the interpretation of plant distribution. Other densities across the majority of the plant's range vary between one plant per 1.9 ha (1 per 4.6 acres) and one plant per 8.5 ha (1 per 21 acres) (Mills 1991, Ecosphere 1992, Roller 1996).

Land areas surrounding developed parts of Green Valley and Sahuarita, Arizona; and those same areas of the San Xavier District of the Tohono O'odham Nation may be very important for the conservation of this species within its range. Analysis of surveys conducted from 1992 to 1995 with a multi-variate, quantitative statistical analysis established a pattern of greater population densities, higher ranks of cactus vigor and reproduction occurring within the transition vegetation type found in this area of the northern Santa Cruz Valley. This area could be defined as an ecotone boundary between semi-desert grasslands and Sonoran desertscrub.

Seedling and sub-adult size classes are not common throughout populations across the range and could be a function of simply not finding such small, well camouflaged plants in a large-scale survey, or because the establishment phase of the seedling may be limited in some unknown way.

Research on Pima pineapple cactus reproduction has suggested that the establishment phase of Pima pineapple cactus life history may be limiting recruitment within populations. Evidence presented to support this conclusion was the abundance of flowers, fruits and viable seed, and the rarity of seedling presence at different sites spread through the plant's range (Roller 1996). Other research has documented the establishment phase of other Sonoran cacti species as being critical to survival to reproductive maturity (Steenbergh and Lowe 1977).

Status and Distribution

Generally, the Pima pineapple cactus grows on gentle slopes of less than 10% and along the tops (upland areas) of alluvial bajadas nearest to the basins coming down from steep rocky slopes. The plant is found at elevations from 720 m (2362 ft) to 1440 m (4593 ft) (Phillips et al. 1981, Benson 1982, Ecosphere Environmental Services, Inc. 1992) in vegetation characterized as either or as combination of both the Arizona upland of the Sonoran desertscrub and semi-desert grasslands (Brown 1982).

The acquisition of baseline information began with surveys documenting the presence of Pima pineapple cactus as early as 1935. More intensive surveys were initiated in 1991 and other research established in 1993 further investigated the reproductive biology, distribution, fire effects and mortalities associated with various threats. Therefore, the best available baseline information is relatively recent and may not represent actual changes in distribution since the declines in the status of the species began. Population degradations and actual changes were likely greater than the numbers presented here in such a narrow time frame. Further, demographic monitoring across the range will be important for continued development of this baseline information and for management purposes the spatial representation of those trends needs to be developed.

Widely scattered surveys were conducted across sites which varied considerably in density between three plants per acre (0.4 ha) to only one plant per 24 acres (9.0 ha). Approximately 50 townships can be delineated within the U.S. range boundaries. However, a considerable amount of land area within the range boundaries due to elevation, topography, hydrology, plant community type, and human degradation does not likely provide habitat for the species. With 22,959 ha (56,730 acres), nearly 10 to 20 percent of the U.S. range area surveyed, a current total of 3,805 individuals have been located since 1935, with the majority since 1991 using more intensive methodology.

It is important to clarify that the above number represents the total number of locations ever found and not the current population size. The quantity which documents the observed and authorized mortalities and transplantations of individuals since the species was listed in 1993 to present, is 2,173 individuals which equals nearly 60 percent of all known locations. A small portion of these mortalities are not associated with any specific human activity. These monitoring results are a sample developed to represent the range-wide status of the Pima pineapple cactus which appears to have been recently impacted with threats which have caused

the elimination of over half of the documented locations.

Transplanted individuals at this time are not be considered as individuals functioning within the context of a self-sustaining population. It is the Service's hope that future monitoring will suggest that the experimental safe zones and transplantation design will facilitate the restoration of viable populations with stable demographics. Until information suggests that we are successful at this restoration effort, transplanted individuals will be not be counted as operative units of the entire population. Further, once individuals are transplanted from a site it is considered to be extirpated as those individuals functioning in that habitat are irretrievably lost.

The area of habitat impacted or authorized to be impacted across a ten year period between 1987 and 1997 (i.e. habitat developed or significantly modified beyond the point where as restoration would be a likely alternative) was roughly 8,702 ha (23,843 acres) which represents 38 percent of the area ever surveyed. In 1998, over 2,300 acres of Pima pineapple cactus were slated to be lost including 1,334 acres from the TASRI (Tucson Aqueduct System Reliability Investigation Reservoir) project, 353 acres from the Las Campanas Housing Development project, and 752 acres from the ASARCO Mission complex project. The TASRI project has not yet been constructed. The number of acres lost through private actions, not subject to Federal jurisdiction, is not known, but given the rate of urban development in Pima County, is thought to be significant.

Based on current knowledge, the following threats documented with this reduction in habitat are viewed as altering the landscape in manner that would be nearly irreversible in terms of supporting Pima pineapple cactus populations: urbanization, farm and crop development, and exotic species invasion following fire. Monitored land areas which appear to support Pima pineapple cactus populations without evidence of fire and exotic species invasion, overgrazing, and off-road vehicle use, and with evidence of reproduction of healthy new individuals, were generally not modified. On lands that have been modified, such as the abandoned agricultural fields at the Quail Creek development near Green Valley, PPC have been found, but their long term suitability and survival in these areas is not known.

Other specific threats which have been previously documented (Service 1993) such as overgrazing and mining have not yet undergone a complete synthesis of the past impacts, however, partial information does exist and can be applied. Mining has resulted in the loss of hundreds, if not thousands, of acres of potential habitat throughout the range of the species. Much of the mining activity has been occurring in the Green Valley area, which is the center of the species' distribution and the area known to support the highest densities of individuals.

Most of the documented habitat development has occurred south of Tucson down through the Santa Cruz Valley to the town of Amado. This area is critical for the future recovery of the species. The expansion of urban centers and mining activities will continue to eliminate habitat and individuals, and result in habitat fragmentation.

The protection of habitat and individuals is complicated by the varying land ownership within the range of this species. An estimated 10 percent of the potential habitat for Pima pineapple cactus is held in Federal ownership. The remaining 90 percent is on Tribal, State, and private lands. Most of the federally owned land is either at the edge of the range or in scattered parcels. The largest contiguous piece of federally owned land is the Buenos Aires National Wildlife Refuge, located at the southwestern edge of the species range at higher elevations and lower plant densities.

Under Section 9 of the Act, the taking of listed animals is specifically prohibited. These prohibitions apply regardless of landownership status. For listed plants, these prohibitions and the protection they afford do not apply. Listed plant species are only protected from deliberate removal from Federal lands. There is no protection against removal from, or destruction of plants on, any non-Federal lands under the Act by a land owner. The Arizona Native Plant Law may delay vegetation clearing on private property for the salvage of specific plants species within a 30-day period. Although State Native Plant Law does prohibit the illegal taking of this species on state and private lands without a permit for educational or research purposes, it does not provide for protection of plants existing in place through restrictions on development activities.

Section 7 protection extends to listed plants regardless of landownership. However, without Federal agency involvement, section 7 does not apply to projects on non-Federal lands. Much of the development likely on State or private lands has a limited exposure to Federal regulatory requirements. Additional Pima pineapple cacti and associated habitat on these lands are almost certain to be lost to as development in southern Arizona continues through the Santa Cruz Valley. Efforts to transplant individual cacti to other locations have had only limited success and, as development increases, other locations will become less evident as habitat is converted.

The entire approach to transplanting Pima pineapple cactus involves three general phases: salvage operations which include hardening-off techniques, replanting techniques, and the selection of suitable habitat to sustain viable populations. Research has determined successful methods for conducting the first two phases involving the salvage and replanting preparation techniques (Margaret Livingston, pers. comm., School of Renewable Natural Resources, The University of Arizona, Roller 1996). However, the third phase involving habitat selection and the re-planting spatial design has been unsuccessful and further study is necessary if transplantation is ever to be considered a viable option for plants impacted by land development. Although an effective transplantation approach involving successful application of all three phases may reduce impacts affecting individual cacti, it will not reduce impacts associated with the reduction of habitat altered by development.

Based on surveys and habitat analysis, the land areas which spread from south of Tucson down through the Santa Cruz Valley to the town of Amado and surrounding developed parts of Green Valley and Sahuarita, and parts of the San Xavier District of the Tohono O'odham Nation, appear to support abundant populations, some recruitment, and units of extensive habitat still remaining. However, the primary impact which has contributed to the status of this species throughout its range is the most recent rate (i.e. since 1993) at which habitat is being developed,

fragmented or modified as has been observed in this general area.

Overgrazing by livestock, illegal plant collection, and fire-related interactions involving exotic Lehmann lovegrass (*Eragrostis lehmanniana*) are also threats which may negatively affect Pima pineapple cactus populations (Service 1993).

Very little is known regarding the effects of low to moderate levels of livestock grazing on Pima pineapple cactus distribution. Currently, a study has been established to observe the effects of grazing on Pima pineapple cactus at the Coronado National Forest. Livestock grazing practices are quite variable. This taxon is patchy in distribution and widely dispersed and occupies relatively xeric soils (i.e. these plants do not inhabit areas immediately adjacent to or along water tanks or streambanks) (Roller 1996) which are not often used by livestock managed at lower stocking rates with increased rotations and periods of pasture rest. However, areas which are overgrazed may threaten populations by increasing the probability of trampling and significantly altering the hydrology which may affect seed dispersal or seedling establishment. Habitat effects of livestock overuse could include erosion, hydrologic and micro-climatic changes, invasion or expansion of exotic grasses due to livestock preferences for native grass species over exotics. Some range management practices such as mechanical imprinting, chaining, ripping, and seeding of nonnative grasses have contributed to the modification and loss of habitat and individual cacti. Overgrazing in some areas continues today.

To what extent overgrazing may directly or indirectly effect the cactus by impacting the structure and function of the ecosystem has not been identified. However, long-term grazing, primarily overgrazing, fire suppression, and drought in arid grassland ecosystems have all been hypothesized as being the cause, either individually or collectively, of changes in arid grassland community structure and function (Bahre 1985). Altered edaphic (stability and water infiltration ability) conditions, caused by damage to micro-biotic and cryptogamic crusts over soils with grazing, have been documented in arid land systems (Schlesinger et al. 1990, Fleischner 1994).

Data on historical change related to Pima pineapple cactus distribution and abundance is not available (not intended to infer we do not have data reflecting recent changes in the species distribution and abundance). We cannot reliably predict cause and effect scenarios for the future due to compounding factors such as climate change, urbanization, legal and political complexities (McPherson 1995). We do not know if the majority of populations of Pima pineapple cactus are sustainable, as plant communities throughout the range of the plant are currently structured and functioning. Thus, the need for information on what is limiting this plant's distribution under current habitat conditions is important.

Vegetation associated with higher Pima pineapple cactus densities, reproduction and greater levels of cactus vigor is described as mid-sized mesquite shrubland with an assortment of other succulent species and native bunch grasses. Many species dominant in this vegetation type are associated with grazing, and are known as "increasers" under some grazing practices. Less grazed pastures did support greater native grass coverage with more species present. However, even with an increased bunch grass abundance, the fuel structure of the community was not

continuous and allowed for substantial open patches along the drip line of shrub species where the cactus often occurs (Roller and Halvorson 1997). Also, specific levels of soil movement are required for seed germination because the seed will not germinate on the surface; it generally germinates at a depth between 0.5 cm to 1.5 cm (0.2" - 0.6") (Roller 1996). Few locations throughout the plant's range have documented the presence of seedlings or sub-adults. However, all but one of the known locations had been grazed within three years of the observation. Whether light to moderate grazing practices provide the appropriate level of soil movement to cause seed germination has not been determined. Over-land sheet flow across these areas may also serve to move soil and deposit it over sediments. The study established on the Coronado National Forest should provide some insight on seed germination relative to specific grazing intensities.

Reduced herbaceous biomass within the immediate proximity of individuals may reduce heat intensity with fire. Reduced herbaceous cover, distributed continuously, decreases fire frequencies in semi-desert grasslands which over the long-term increases cactus survival following fire (McPherson 1995, Thomas and Goodson 1992), and limits fire uniformity within burned areas due to the discontinuity of fine fuels (Wright and Bailey 1982).

The invasion of Lehmann lovegrass combined with fire is a threat to Pima pineapple cactus populations. Continuous distribution of fuels and greater biomass near the apex of individual plants have been hypothesized as increasing mortality following fire (Roller and Halvorson 1997). Research shows that fire increases Lehmann lovegrass distribution and suggests fire intensity and fire frequency increases with Lehmann lovegrass invasion (McPherson 1995).

Based on the monitoring results, the range-wide status of the Pima pineapple cactus appears to have been recently impacted with threats which completely alter or considerably modify over a third of the species' surveyed habitat and has caused the elimination of nearly 60 % of the documented locations. These values are supplied to serve as an extrapolation of the situation which might be taking place across the rest of the entire population. Current information regarding the status of this species is in great need of more precise and thorough spatial analysis through the use of geographical information systems and databases than is available at present.

As discussed prior, the widely scattered distribution of the species surviving at low densities within the occupied habitat results in small populations widely spread across the known range. These clusters of individuals are becoming increasingly isolated as urban development, mining, and other commercial activities continue to detrimentally impact the habitat. The remaining habitat also is subject to degradation or modification from current land management practices, increased recreational use when adjacent to urban expansion (i.e. off-road vehicle use and illegal collection), and the continuing aggressive spread of nonnative grasses into its habitat. Habitat fragmentation and degradation will likely continue into the foreseeable future based on historic data and growth projections produced by the Pima County Association of Governments in their 1995 Population Handbook. There is very little Federal oversight on ways to provide conservation measures that would protect or recover the majority of the potential habitat. Even some areas legally protected under the Act have been modified and may not be able to support

viable populations of the Pima pineapple cactus over the long-term.

ENVIRONMENTAL BASELINE

The environmental baseline includes past and present impacts of all Federal, State, or private actions in the action area, and the anticipated impacts of all proposed Federal actions in the action area that have undergone formal or early Section 7 consultation. It also includes the impact of State and private actions which are contemporaneous with the consultation process. The environmental baseline defines the current status of the species and its habitat in the action area to provide a platform to assess the effects of the action under consultation.

Information on the status of the Pima pineapple cactus on the Nation is not available. Within the 80 acre project site, 41 plants have been documented. Except for Interstate 19 which forms the western boundary and Pima Mine Road which forms the southern boundary, the area is otherwise generally undisturbed. Although the surrounding land has not been surveyed, it likely holds similar densities of PPC.

EFFECTS OF THE ACTION

Both direct and indirect adverse impacts will occur to Pima pineapple cactus. The proposed Casino site will directly affect 35 of 41 Pima pineapple cactus and 66 acres of habitat. Of the 35 cacti to be removed, four to six of those individuals will be transplanted to the remaining 14-acre northwest corner where six individual plants already exist. It is not known what effect doubling the density of PPC on this 14 acre plot will have on the existing six individuals, or on the success of the transplants. Efforts to transplant individual cacti to other locations have had only limited success. Since TONNRD will monitor the 14 acre plot monthly for the first six months, and then quarterly for a two year period, this information will be available during the life of this mitigation plan. The lack of designated conservation areas to contribute to the long term maintenance of the species will continue to prohibit recovery. The proposed conservation actions included in the biological assessment are critical to offset this impact to Pima pineapple cactus.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

Development of the area along I-19 can be expected to increase in the vicinity of the Casino. Future actions by Tohono O'odham may or may not be considered Federal actions. The Service is not aware of any proposed non-Federal action that may affect species or critical habitats considered in this consultation.

INCIDENTAL TAKE STATEMENT

Sections 7(b)(4) and 7(o)(2) of ESA do not apply to the incidental take of listed plant species. However, protection of listed plants is provided to the extent that ESA requires a Federal permit for removal or reduction to possession of endangered plants from areas under Federal jurisdiction, or for any act that would remove, cut, dig up, or damage or destroy any such species on any other area in knowing violation of any regulation of any State or in the course of any violation of a State criminal trespass law.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of ESA directs Federal agencies to utilize their authorities to further the purposes of ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. The recommendations provided here relate only to the proposed action and do not necessarily represent complete fulfillment of the agency's section 7(a)(1) responsibility for this species. Actions proposed as part of the proposed project are not included here. The Service recommends the following actions:

1. Continue large-scale planning efforts to include the protection of Pima pineapple cactus habitat.

2. Evaluate opportunities and resources for the TONNRD to provide technical management of Pima pineapple cactus on Nation land.

3. Facilitate an equal share of PPC seeds and seedlings between ASDM and TONNRD at the end of the mitigation plan.

CLOSING STATEMENT

This concludes formal consultation on the proposed action outlined in the request. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been maintained (or is authorized by law) and if: (1) new information reveals effects of the agency action that may affect Pima pineapple cactus in a manner or to an extent not considered in this opinion; (2) the agency action is subsequently modified in a manner that causes an effect to the Pima pineapple cactus that was not considered in this opinion; or (3) a new species is listed or critical habitat designated that may be affected by the action.

If we can be of further assistance, please contact Debra Bills (x239) or Tom Gatz (x240) of my staff.

Sincerely,

/s/ David L. Harlow
Field Supervisor

cc: Regional Director, Fish and Wildlife Service, Albuquerque, NM (GM-AZ/NM)
Director, Bureau of Indian Affairs, Phoenix AZ
SWCA, Inc., Tucson, AZ (Attn: Tina Lee)
Tohono O'odham Gaming Authority, Tucson, AZ (Attn: Tom Arnold)
Director, Tohono O'odham Natural Resources Department, Sells, AZ
Plant Program Manager, Arizona Department of Agriculture, Phoenix, AZ
Director, Arizona Sonoran Desert Museum, Tucson, AZ (Attn: B. Skye)

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